Soviet Combat Engineers in Afghanistan

Old Lessons and Future Wars

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Soviet sappers advancing with mine probes, sniffer dogs, and induction ine detectors in advance of a column of forces. (top) Russian sappers catching a ride on an APC with their sniffer dog. Their use to find mines dates from World War II. Their services in Afghanistan quickly became a vital key to successful movement support. (bottom)

In mid-April 1945, three Soviet *fronts* (army groups) totaling 2.5 million troops, 6,200 tanks and self-propelled guns, 42,000 artillery pieces and mortars, and 7,500 combat aircraft began a strategic offensive operation to encircle and destroy defending German forces and seize Berlin. These Soviets were the veterans of nearly four years of war conducted on a scale and intensity

that in most aspects would have to, be regarded as unprecedented. Among the hard lessons learned in what the Soviets call the "Great Patriotic War" was the critical role played by engineer troops in large combined arms operations. As a result, engineer support of the Berlin Operation reflected the Soviet practice of saturating the participating *fronts* with engineer forces needed along the main directions of attack.

The major effort in the Berlin Operation was conducted by the 1st Belorussian *Front* under Marshal G. K. Zhukov, whose mission was to penetrate 20 to 40 kms of enemy defensive positions and natural barriers on the way to Berlin and to assault the city. Extensive engineer preparations for the attack included establishing 25 bridges and 40 ferry crossings over the Oder River in the 1st Belorussian zone. Given the nature of enemy defenses and the constricted, urbanized terrain, combat engineer support required special consideration. Some 84 engineer companies of the *front* constituted assault detachments and groups tasked to establish paths through mixed minefields and obstacles for infantry, armor, and artillery units.

When the operation began on April 16, *front* engineers and supporting elements created 340 such passages and removed over 70,000 mines. These assault groups which typically included infantry, armor, and flame thrower units supported the advance of *frontal* forces deep into enemy defenses and into the German capital, where the Soviets advanced slowly.

Combat engineers used breaching measures and limited vehicles, such as mine rollers and dozer blades. They were also heavily engaged as infantrymen. Soviet writings state that engineer subunits and shock groups of the 1st Belorussian *Front* made 1,500 breaches in building walls and roofs, cut 1,000 passages through barricades, and destroyed 159 buildings that were strong points for the enemy.

The Berlin Operation reflected the massive use of engineer troops that characterized Soviet combined arms operations by the end of the war. As Soviet sources report, a concentration of 17 to 22 engineer companies per km of breakthrough frontage was typical by the war's end and the use of specialized bridge, road, and railroad engineer troops was integral to such operations. After the war, there was an extensive Soviet study of engineer lessons learned from major World War 11 operations, a reflection of justifiable pride in the engineers' performance, and an affirmation of the importance of large-scale engineer support in a future nuclear or conventional NATO/Warsaw Pact conflict.

Forty years after the war, however, Soviet military forces were involved in a conflict far from the battlefields projected for Central Europe, but one in which all types of engineer support were just as essential for military operations. As senior Soviet military engineer officers have noted, *the lessons of Afghanistan are influencing Soviet methods of engineer support force wide*.

The Invasion of Afghanistan and Engineer Support Requirements: In October 1987, shortly after assuming his post as Chief of Engineer Troops of the Ministry of Defense of the USSR, Lt. Gen. Vladimir P. Kuznetsov wrote that in Afghanistan "there is not a single battle that is organized without the participation of engineer troops." He then noted that this level of engineer combat activity was not diminishing even during Afghan "national reconciliation." There was every indication as Soviet forces began to leave Afghanistan on May 15,1988, that engineer

support of withdrawing and remaining forces would be even more critical for them to function and, perhaps, survive.

It is useful, then, to review Soviet approaches to engineer support, particularly that of combat engineers, in over eight years of war against the Afghans and to address the broader implications of lessons learned.

When Soviet Airborne Troops began to land at key points in Afghanistan in late December 1979, they were spearheading a military force that should have been very familiar with most aspects of Afghan geography, climate, lines of communication (LOC's), and other factors that affect military operations in a mountain-desert environment.

Fifteen years earlier, Soviet engineers had built numerous road LOC's in northern Afghanistan and Soviet military advisors had helped train the Afghan Armed Forces for some time. Also, there are areas in the Soviet Union similar to the terrain, climate, and environment of Afghanistan, and the study of military operations under these Soviet designated "special conditions" was common in the pre-Afghan military press.

After the Airborne Troops had arrived and secured the Afghan capital, three to four motorized rifle divisions crossed into the country and moved to occupy population centers. While march discipline and driver performance left much to be desired, engineer support of the tactical (largely administrative) movement enabled Soviet columns to quickly reach their objectives.

The apparent smoothness of this initial Soviet military effort, however, was short-lived. The limited Afghan road network had to support an extraordinary level of military and civilian traffic, together with national economic and local transport, traveling over routes that in many cases could not sustain such usage. Rugged terrain, the climate, and the dramatic extremes of weather also added considerably to LOC maintenance and support problems.

Operations in Afghanistan can only have intensified Soviet views that penetrating defenses and supporting movements on a future European battlefield would require extraordinary engineer troop support.

These conditions alone required a heavy Soviet commitment of special non-divisional road and LOC construction units called Highway Troops, in addition to engineer forces organic to tactical units. Superimposed on these difficulties was a widespread, intensive, and increasingly innovative and successful mining and ambush interdiction by Afghan freedom fighters. The mine/ambush problem focused Soviet attention on using combat engineers, "engineer-sappers," to support combat and logistic movements. Combat engineers were also used in a mining campaign to cut off *mujahedin* supply routes; protect Soviet military bases, facilities, and outposts; and deny areas to both resistance forces and civilians.

Mine Clearing and Movement Support: One intriguing by-product of the Soviet military experience in Afghanistan has been the creation of a substantial body of material about mine clearing and movement support. A few examples give some insight into the nature and size of

the mine problems as Soviet sappers see them, their consequences, and Soviet methods of dealing with them.

The commander of an airborne combat engineer company, the kind of elite unit that often precedes combat and logistic columns and support counterinsurgency operations, offered some advice in 1985 to his fellow engineers. He judged that travel over some Afghan roads should be done slower than across country because of the mines. He noted the resisters' use of antitank, antipersonnel, and dummy mines, as well as controlled mines and improvised explosive charges including, in one case, a 500-kilogram aviation bomb his unit found planted on a route of advance.

(Left) The mine on the left was reported to be of Italian origin. (Right) Mine extraction by means of a grapnel.

The officer discussed the difficulty of finding and disarming mines in mountain-desert terrain and the need to be alert for disturbed areas or ground that had a different texture or color. He cautioned about checking for mines before entering buildings that had been occupied by insurgents and avoiding apparently discarded items that may be rigged to explode. Finally, he noted that "mixed minefields are often ... under the observation of bandits (a frequent Soviet term for the *mujahedin*) sitting in ambush. Therefore, ... it is necessary to assume the defense and be in constant readiness to act."

The basic advice offered by this captain has been repeated by other Soviet sappers and reflects the general concerns that have preoccupied Soviet combat engineers during the Afghan conflict. Of particular concern have been the variations and innovations used in placing mines and the increasing difficulties in dealing with "foreign manufacture" and explosive devices produced locally. A 1986 article by two Soviet colonels discussed and illustrated five mine placing variants that included a mine detonated by a pressure-activated electric switch, a reinforced wire-controlled mine, a reinforced mine with electric switch contacts hidden at the bottom of a water filled track, an antitank mine equipped with mine clearers, and a method of protecting mines against prodders.

The article also lists the specifications of eight Western antitank mines including Italian plastic models that the Soviets find particularly hard to detect. These mines, buried up to 70 centimeters deep, are said to be unpredictable in that 100 vehicles may roll over them only to have the 101st detonate them as the soil becomes more compressed.

Afghan *mujahedin* engaged in planting a landmine. As the war progressed, these freedom fighters developed some intensive and innovative mining and ambush interdiction procedures which forced Soviet planners to widespread use of combat engineers and highway troops to support combat as well as logistics movements.

Sappers are warned about antivehicle and antipersonnel mines used in combinations to delay clearing efforts while columns are attacked, that most *mujahedin* mines have anti-lift/anti-tamper devices, the use of metal fragments scattered in dirt to confuse metal detectors, the high metal content that naturally occurs in some rocky surfaces, and the practice of wrapping mines in cellophane or sprinkling them with oil to avoid detection by mine-sniffing dogs.

In addition to mined roads, their shoulders, and approaches, the Soviets report that helicopter landing areas, off-road parking areas, and trails leading to water sources are also mining targets. The *mujahedin* are said to prepare areas for mining beforehand (by making emplacement sites or laying detonation wires) so that mines can be quickly emplaced just before a column approaches and between the gaps in subunits and units. Wire and radio controlled mines are set off to destroy vehicles in several places at the same time.

Soviet perceptions of NATO capabilities to create dense minefields across Central Europe are seen by Soviet planners as threats to successful offensive operations. We must reinforce these concerns.

These examples indicate the kinds of mine-clearing issues that Soviet sappers have been addressing during the conflict. They also reflect a *mujahedin* mine warfare effort that has been successful in slowing and halting Soviet columns, isolating Soviet garrisons, and limiting counterinsurgency operations. The effect of these actions on shaping Soviet military activity in Afghanistan cannot be stressed enough. Therefore, Soviet attempts to deal with mine warfare and movement support functions are instructive.

Increasing emphasis was put on what the Soviets call "engineer reconnaissance": surveying routes in advance of columns, identifying mined or potentially mined areas, assessing portions of the route that could impede movement, and locating potential by-passes. Depending on the circumstances and composition of the reconnaissance party, at least an initial clearance of mines and obstacles along the route may be carried out. Usually, an engineer reconnaissance patrol for a conventional road could comprise a combat engineer section, a vehicle-mounted induction mine detector, a tank-mounted mine clearer and dozer blade, and a heavy mechanical bridge element. However, Soviet experience in Afghanistan has modified this typical, largely vehicle-based composition for several reasons.

The limited Afghan road network had to support an extraordinary level of military and civilian traffic. In many cases, the roads could not sustain such usage. The rugged terrain, the climate, dramatic extremes in weather, and ambush and mining operations by the *mujahedin* complicated the problem and created the need for engineer forces organic to tactical units and LOC construction units, called highway troops.

First, many roads and movement areas cannot sustain the passage of heavy equipment. Equally important was the failure to detect or explode mines adequately. For example, mines sometimes detonated under the tracks of tank mine clearers making sharp turns on dirt roads. It was found that, in these cases, the mine rollers deviated from the route and left it unswept. This also happened on steep upgrades when mine rollers lifted above the road and did not exert enough

pressure to explode a mine. In addition, induction mine detectors have not been able to reliably find some types of mines because they have a low metal content. Thus, heavy reliance has been placed on sapper teams using mine probes and sniffer dogs. This has substantially limited the speed of column movement and that of dismounted combat units operating off road.

Combat engineers must perform a good part of their job on foot, therefore their equipment received closer attention. According to the Soviets, mine-clearing sappers in Afghanistan usually carry some 20 to 25 kilograms of road gear including body armor, mine detectors, probes, markers, entrenching tools, rope, grapnels, mine-detonating explosives, automatic weapons, ammunition, food, and water.

Because they are important in combat engineer operations, the use of dogs must be examined. The Soviet military has had formal dog breeding and training programs since the 1920's and dogs trained to find mines (and to perform other functions) were used widely in World War 11 by sappers and other units. In Afghanistan, mine-sniffing dogs have been integral to movement support and became more important as the war progressed. German shepherds are the breed of choice and much has been written about their mine-clearing duties.

The problems associated with dogs working in Afghanistan's hot weather, the fatigue of long journeys by armored personnel carrier (APQ, how gasoline fumes dull the dogs' sense of smell, and other issues addressed in the military press all testify to the attention the Soviets give to this old, but still important, means of military support.

Helicopters are also vital to Soviet engineer reconnaissance. Rotary wing aircraft survey and photograph routes and they deliver sapper teams of various composition (including dogs) and engineer equipment to designated areas. Enemy fire, of course, is always a factor on such missions. In one case, however, a Soviet helicopter flying low cover for a column moving through a narrow mountain gorge was downed when an APC detonated a land mine. The flying rock fragments from the explosion damaged the rotor blades, requiring an emergency landing, and added a new dimension to the land mine problem for Soviet aviators to consider.

Engineer reconnaissance is done before columns move along roads or units move off road. But, because of the *mujahedin* successes in quickly planting mines between gaps in units and subunits and after forward sweeping elements have passed, engineer reconnaissance is conducted in the columns as well. This provides a double check for mines that may have been missed by advance elements. Engineer reconnaissance units are part of a more elaborate engineer force called a "movement support detachment." The precursors of today's movement support detachments were formed by the Soviets in World War 11 to assist the movement of units on the march, in the depths of enemy defense, and in the pursuit. Under the conditions faced in Afghanistan, however, the role played by these detachments grew noticeably.

Besides the engineer reconnaissance elements, a movement support detachment could comprise additional mine-clearing teams with sappers and mine-detecting and clearing instruments located in a column; obstacle demolition teams comprising Highway Troops, tank-mounted dozers, and demolition specialists to clear man-made and natural obstacles; and road and bridge construction teams composed of Highway Troops, bridge-laying tanks, prefabricated bridge construction

elements, crane trucks, and heavy mechanical bridge elements. Motorized rifle and other combat elements are routinely used to reinforce these detachments. Again, the size and composition of such task-organized detachments varies, as will the kind of terrain and movement problems projected. Soviet movement in most Afghan areas would not be possible without these large detachments.

As the difficulties encountered by Soviet forces in pushing columns through to relieve the eastern Afghanistan garrison at Khost in late 1987 indicate, Soviet problems remain far from solved. It should be noted that even those small counterinsurgency teams and groups operating in remote areas include substantial sapper elements to support operations.

Because of the missions they perform, sappers (as well as road and bridge construction engineers of the Highway Troops) have suffered heavy casualties and frequently engaged in combat with *mujahedin* forces. Combat engineers were among the most highly decorated troops in Afghanistan. The first individual to be awarded the title of Hero of the Soviet Union (a distinction analogous to receiving the Congressional Medal of Honor) was an airborne combat engineer who ran out of ammunition while under attack and died when he used a grenade to blow up himself and attacking insurgents.

Much attention. has been given to a combat engineer officer, Col. Gennadi Loshkarov, who was involved in mine-clearing operations in Afghanistan. He was the first officer in the Ground Forces to be awarded all three classes of the order "For Service to Motherland in the USSR Armed Forces." Although badly wounded by an Italian mine, he returned to Afghan duty. He was instrumental in recording and institutionalizing lessons learned from dealing with various mines while in country. Later, he served as an instructor at the Kuibyshev Military Engineering Academy in Moscow to pass on his extensive experience. The Loshkarov example is one facet of Soviet efforts to record and incorporate engineer lessons learned in the military educational system. Other Afghan veterans assigned to force wide units also pass on their experience in a unit setting.

(Left) The road from Kabul to Jalalabad was built with Soviet aid before the invasion. Soviet forces thus must have been very familiar with most aspects of Afghan geography, climate, and LOC's affecting military operations in a mountainous country. (Right) A destroyed Soviet vehicle along the road between Kabul and Pol-e-Khomri. It has apparently been stripped of anything of value by the *mujahedin.*

Lessons Learned and Implications: In November 1941, the Soviet Supreme High Command issued the order "On the Underestimation and Incorrect Use of Engineer Forces and Means." Often cited in Soviet military writings on engineer operations, it specified many shortcomings in controlling, organizing, equipping, and employing engineer forces and set out corrective measures. Prewar Soviet views on the engineer support needed did not comply with the requirements generated, a situation that quickly became evident. For Soviet planners, this precedent illustrates the consequences of misperceiving the nature of future war-in this case, the composition and employment of engineer units.

The attention being given to engineer experiences in Afghanistan, the continuing study of lessons learned from World War 11 and local wars, and new technological developments also reflect this concern. Thus, Soviet planners are carefully studying the use of mines in the Falklands conflict and the difficulties in dealing with the types of mines employed against British forces.

They are scrutinizing Western methods of interdicting movements that include the remote delivery of scatterable mines by NATO forces, technical characteristics of all types of mines, the use of minefields and other barriers on West German territory, the composition and employment of engineer units in NATO armies, specialized topics like NATO approaches to engineer support in built-up areas, and the use of Western special operations forces and airborne/airmobile units. These areas of Soviet analytical interest reflect concerns about Western measures that could slow attack tempos, delay timely reinforcement, reduce effective logistic support, and prevent or delay the achievement of tactical or operational objectives on important axes.

Afghanistan can only have intensified Soviet perceptions that penetrating defenses and supporting movements on a future European battlefield would require extraordinary combat engineer support. Thedifficulties in detecting and clearing new generations of mines have preoccupied Soviet forces during this war. *The mujahedin's* use of barriers like rock slides, craters , fires, and other obstacles created from locally available material has been quite effective, probably far more than Soviet planners anticipated.

In addition to teaching new Soviet engineers basic skills, Afghanistan may have made far more real for the Soviet military those problems they have addressed in historical and theoretical writings. Soviet perceptions of NATO capabilities to rapidly create dense minefields across broad areas; NATO engineer plans to set up numerous barriers, obstacles, and choke points by non-explosive methods; and the urbanization and reforestation that has changed the terrain of Central Europe are seen by Soviet planners as formidable threats to successful offensive operations.

Soviet planners may now believe that, as in 1941, engineer requirements for dealing with these military problems have been underestimated. For U.S. and NATO planners looking at how engineer support can enhance conventional defense, Soviet perceptions should be given the closest attention. By carefully and repeatedly examining engineer support requirements and performance in historical precedents, local conflicts like Afghanistan, and for a future conflict with NATO, Soviet military writings may highlight areas of focus toward which our forces and resources should be directed.

It is worth noting that in 1986 the Soviets chose to reprint a presentation given by Colonel-General of Engineer Troops A. 1. Proshliakov at a 1946 conference held in the Group of Soviet Forces, Germany. The conference dealt with the Berlin Operation and Proshliakov's assessment addressed "Engineer Support of Troops of the 1st Belorussian *Front*."

The Berlin Operation epitomized those engineer difficulties imposed by urban terrain and penetrating prepared defense. This is the kind of effort Soviet planners wish to avoid and which their current concepts like tactical and operational maneuver, airborne/air assault operations, surprise, and deception are designed to avoid. But the operation emphasizes for the Soviets the engineer (and other) force levels needed to deal with extensive minefields, engineer barriers, natural obstacles, and built-up areas.

The Soviets are concerned that innovative U.S. and NATO approaches based on new technologies, old lessons, and a changing European environment may be able to recreate analogous conditions. We must reinforce these concerns and fully translate the potential of effective engineer support into a real defense capability.